

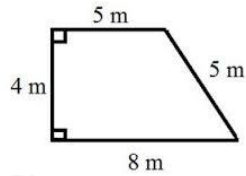
GEOMETRY CHAPTER 2 SELF ASSESSMENT

Prove that you are able to meet Chapter 2 goals by completing the 9 problems contained in the Chapter 2 Review. Rate yourself on each goal by putting a check mark in the green, yellow, or red light box. After you rate yourself on each goal, prioritize which goals you need to work on first. Red light goals are your highest priority (Level 1) and need immediate attention or help from the teacher. Yellow light goals are medium priority (Level 2-3) and you will need additional practice. Green light goals have been mastered and are your lowest priority (Level 4). Following the Chapter 2 Review Answer Key you will find additional help for each goal. There are links to online tutorials and extra set of practice problems with answer keys in order to help you study independently.

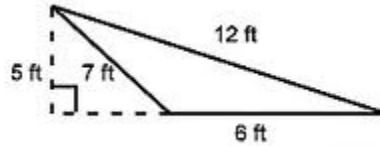
Goal "I am able to..."	Prove You Can Do It!	Green Light	Yellow Light	Red Light	Priority Level
Find the area of a trapezoid using the formula $A = \frac{1}{2}(\text{base}_1 + \text{base}_2)(\text{height})$	Problem 1				
Find the area of a triangle using the formula $A = \frac{1}{2}(\text{base})(\text{height})$	Problem 2				
Find the area of composite shapes by decomposing complex shapes into simpler shapes	Problem 3				
Simplify algebraic expressions by multiplying two binomial expressions using FOIL or Box Method	Problem 4				
Identify relationships between two or more angles in order to set up equations and calculate missing angle measures	Problem 5, 6, and 7				
Write equations and graph perpendicular lines when given one linear equation and a point	Problem 8				
Understand the Triangle Inequality Theorem and be able to determine whether or not a triangle exists when given side measures	Problem 9				

CHAPTER 2 TEST REVIEW

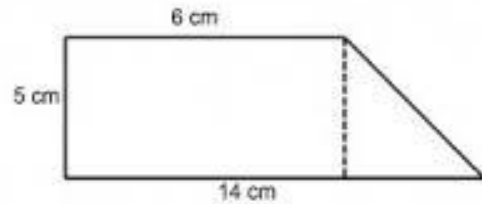
- 1) Find the area of this trapezoid.



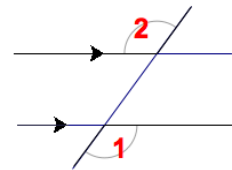
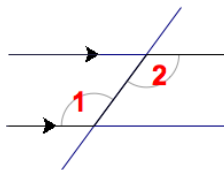
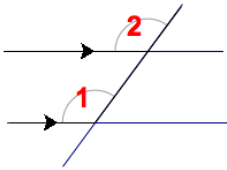
- 2) Find the area of this triangle.



- 3) Find the area and perimeter of this shape.
Hint: You will need to use the Pythagorean Theorem.



- 4) Simplify: $(2x + 3)(3x - 6)$



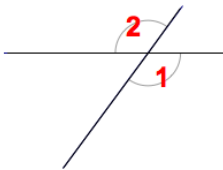
- 5) Identify the angle relationship in each diagram and state whether the angles are equal or supplementary.

1.

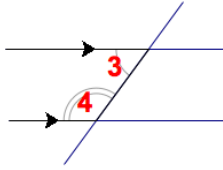
2.

3.

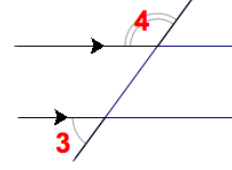
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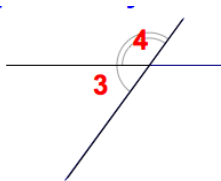
5.



6.

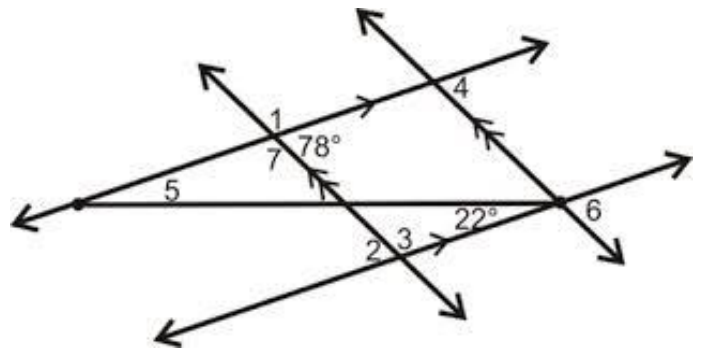


7.



- 6) Find the measure of each angle.

$m\angle 1 = \underline{\hspace{1cm}}$ $m\angle 5 = \underline{\hspace{1cm}}$



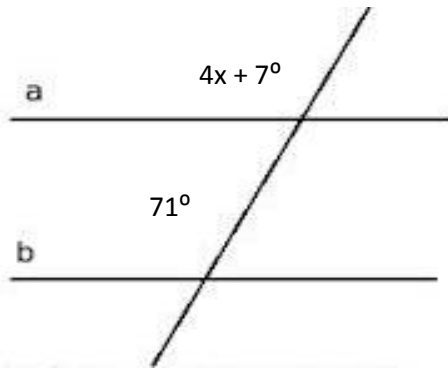
$$m\angle 2 = \underline{\hspace{2cm}} \quad m\angle 6 = \underline{\hspace{2cm}}$$

$$m\angle 3 = \underline{\hspace{2cm}} \quad m\angle 7 = \underline{\hspace{2cm}}$$

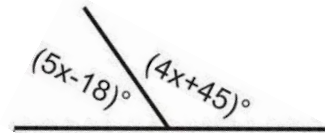
$$m\angle 4 = \underline{\hspace{2cm}}$$

7) Find the value of x .

1.



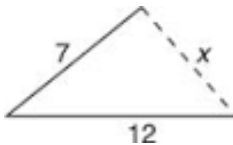
2.



8) Find the equation of the line perpendicular to $y = -\frac{1}{4}x - 3$ that goes through $(-4, -2)$.

- Graph $y = -\frac{1}{4}x - 3$
- Graph the line that is perpendicular passing thru the point $(-4, -2)$.
- Write the equation of the perpendicular line in the form of $y = mx + b$

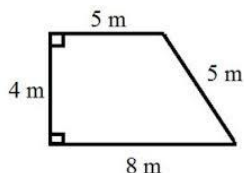
9)



Complete the inequality: $\underline{\hspace{2cm}} < x < \underline{\hspace{2cm}}$

Answer Key

1)



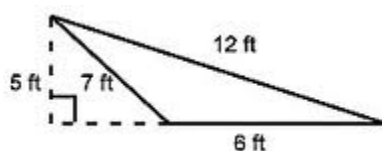
$$\text{Area} = \frac{1}{2} (\text{base}_1 + \text{base}_2)(\text{height})$$

$$\text{Area} = \frac{1}{2} (5 + 8)(4)$$

$$\text{Area} = \frac{1}{2} (13)(4)$$

$$\text{Area} = 26 \text{ m}^2$$

2)

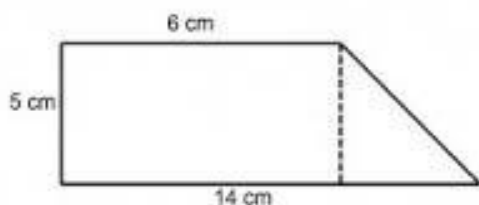


$$\text{Area} = \frac{1}{2}(\text{base})(\text{height})$$

$$\text{Area} = \frac{1}{2}(6)(5)$$

$$\text{Area} = 15 \text{ ft}^2$$

3)



$$\text{Area of Rectangle} = (\text{base})(\text{height}) = (14)(5) = 70 \text{ cm}^2$$

$$\text{Area of Triangle} = \frac{1}{2}(\text{base})(\text{height}) = \frac{1}{2}(14-6)(5) = \frac{1}{2}(8)(5) = 20 \text{ cm}^2$$

$$\text{Total Area} = 70 + 20 = 90 \text{ cm}^2$$

Use Pythagorean Theorem to find unknown side of triangle.

$$a^2 + b^2 = c^2$$

$$5^2 + (14-6)^2 = c^2$$

$$25 + 64 = c^2$$

$$89 = c^2$$

$$9.43 \text{ cm} = c$$

$$\text{Perimeter} = 5 + 6 + 14 + 9.43 = 34.43 \text{ cm}$$

4) $(2x + 3)(3x - 6) = 6x^2 + 9x - 12x - 18 = 6x^2 - 3x - 18$

- 5)
1. Corresponding Angles, equal
 2. Alternate Interior Angles, equal
 3. Alternate Exterior Angles, equal
 4. Vertical Angles, equal
 5. Same Side Interior Angles, supplementary
 6. Same Side Exterior Angles, supplementary
 7. Linear Pair/Straight Angle, supplementary

6)

$$\begin{aligned} m\angle 1 &= 102^\circ & m\angle 5 &= 22^\circ \\ m\angle 2 &= 78^\circ & m\angle 6 &= 78^\circ \\ m\angle 3 &= 102^\circ & m\angle 7 &= 102^\circ \\ m\angle 4 &= 78^\circ \end{aligned}$$

- 7) 1. These angles are corresponding therefore they are equal.

$$4x + 7^\circ = 71^\circ$$

$$4x = 64^\circ$$

$$x = 16^\circ$$

2. These angles are supplementary therefore their sum is 180° .

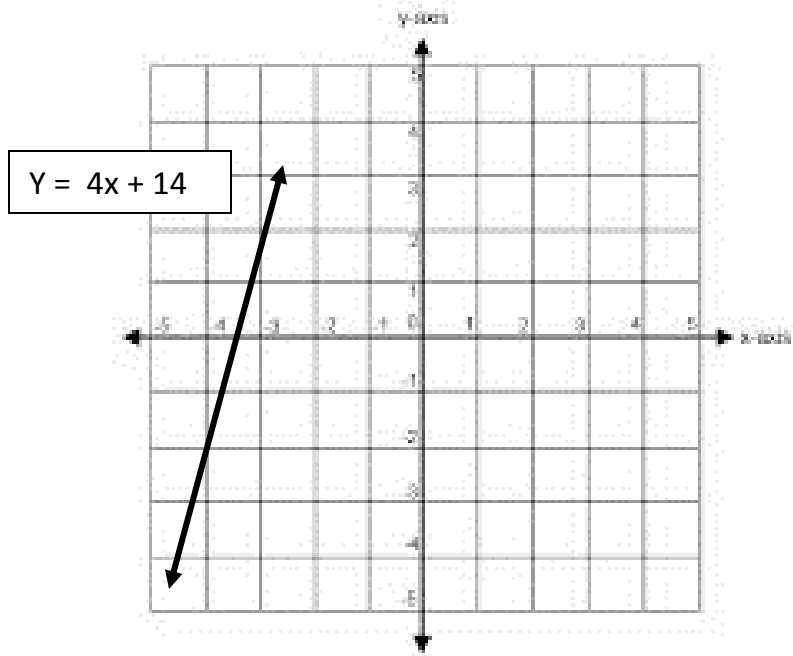
$$(5x - 18) + (4x + 45) = 180^\circ$$

$$9x + 27 = 180^\circ$$

$$9x = 153^0$$

$$x = 17^0$$

8)



Slopes of perpendicular lines are opposite reciprocals of each other.

The slope of the line perpendicular to $y = -\frac{1}{4}x - 3$ is 4.

To find the equation of the perpendicular line you can enter the slope and the point $(-4, -2)$ into the equation of a line $y = mx + b$ to find b .

$$-2 = 4(-4) + b$$

$$-2 = -16 + b$$

$$14 = b$$

The equation of the new line is:

$$y = 4x + 14$$

$$Y = -\frac{1}{4}x - 3$$

- 9) Largest possible side = sum of other two sides = $7 + 12 = 19$
 Smallest possible side = difference of other two sides = $12 - 7 = 5$

$$5 < x < 19$$

PROBLEM #1 PRACTICE: FINDING AREA OF A TRAPEZOID

Online Help: [How the Formula Works Using Parallelograms](#), [Sample Problem](#), [Area Formula for Trapezoid Song](#)

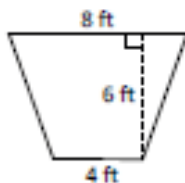
Area of Trapezoid

Formula:

$$\text{Area} = \frac{1}{2} (\text{base}_1 + \text{base}_2)(\text{height})$$

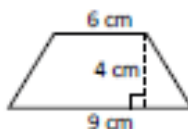
Find the area of each trapezoid.

1)



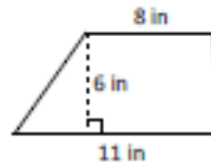
Area = _____

2)



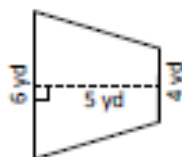
Area = _____

3)



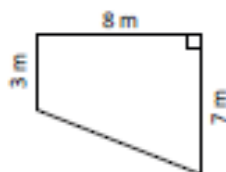
Area = _____

4)



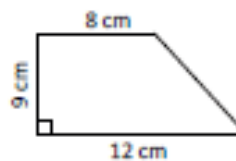
Area = _____

5)



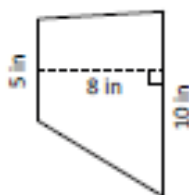
Area = _____

6)



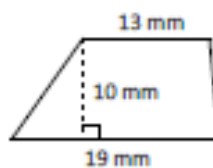
Area = _____

7)



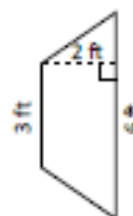
Area = _____

8)



Area = _____

9)



Area = _____

ANSWER KEY

Formula:

$$\text{Area} = \frac{1}{2} (\text{base}_1 + \text{base}_2)(\text{height})$$

1) $A = \frac{1}{2} (8 + 4)(6)$

$$A = \frac{1}{2} (12)(6)$$

$$A = \frac{1}{2} (72)$$

$$A = 36 \text{ ft}^2$$

2) $A = \frac{1}{2} (6 + 9)(4)$

$$A = \frac{1}{2} (15)(4)$$

$$A = \frac{1}{2} (60)$$

$$A = 30 \text{ cm}^2$$

3) $A = \frac{1}{2} (8 + 11)(6)$

$$A = \frac{1}{2} (19)(6)$$

$$A = \frac{1}{2} (114)$$

$$A = 57 \text{ in}^2$$

4) $A = \frac{1}{2} (6 + 4)(5)$

$$A = \frac{1}{2} (10)(5)$$

$$A = \frac{1}{2} (50)$$

$$A = 25 \text{ yd}^2$$

5) $A = \frac{1}{2} (7 + 3)(8)$

$$A = \frac{1}{2} (10)(8)$$

$$A = \frac{1}{2} (80)$$

$$A = 40 \text{ m}^2$$

6) $A = \frac{1}{2} (8 + 12)(9)$

$$A = \frac{1}{2} (20)(9)$$

$$A = \frac{1}{2} (180)$$

$$A = 90 \text{ cm}^2$$

7) $A = \frac{1}{2} (10 + 5)(8)$

$$A = \frac{1}{2} (15)(8)$$

$$A = \frac{1}{2} (120)$$

$$A = 60 \text{ in}^2$$

8) $A = \frac{1}{2} (13 + 19)(10)$

$$A = \frac{1}{2} (32)(10)$$

$$A = \frac{1}{2} (320)$$

$$A = 160 \text{ mm}^2$$

9) $A = \frac{1}{2} (3 + 6)(2)$

$$A = \frac{1}{2} (9)(2)$$

$$A = \frac{1}{2} (18)$$

$$A = 9 \text{ ft}^2$$

PROBLEM #2 PRACTICE: FINDING AREA OF A TRIANGLE

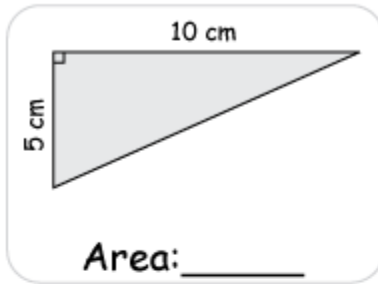
Online Help: [Formula and Sample Problem](#), [Sample Problem](#), [Area of a Triangle Rap](#)

Find the area of the triangles.

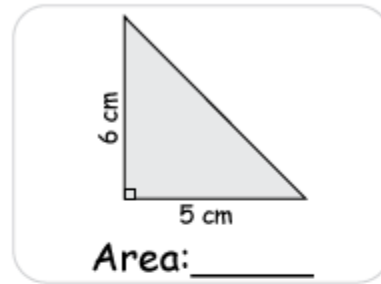
Formula:

$$\text{Area} = \frac{1}{2} (\text{Base})(\text{Height})$$

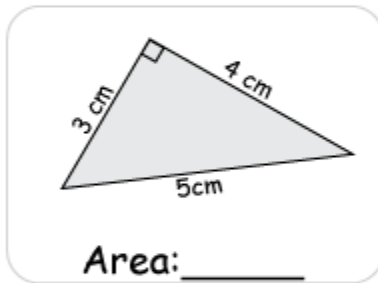
1.



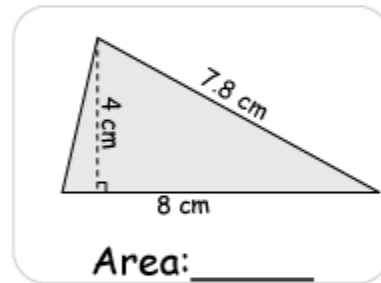
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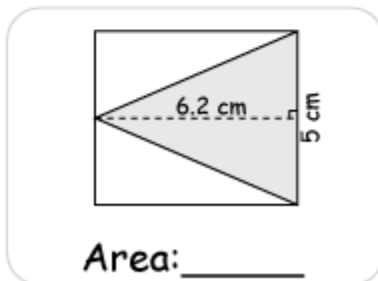
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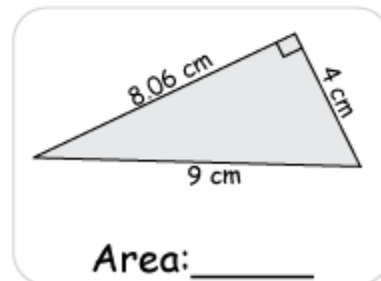
5.



3.



6.



ANSWER KEY

Formula:

$$\text{Area} = \frac{1}{2} (\text{Base})(\text{Height})$$

1) $A = \frac{1}{2}(10)(5)$
 $A = \frac{1}{2}(50)$
 $A = 25 \text{ cm}^2$

4) $A = \frac{1}{2}(6)(5)$
 $A = \frac{1}{2}(30)$
 $A = 15 \text{ cm}^2$

2) $A = \frac{1}{2}(3)(4)$
 $A = \frac{1}{2}(12)$
 $A = 6 \text{ cm}^2$

5) $A = \frac{1}{2}(4)(8)$
 $A = \frac{1}{2}(32)$
 $A = 16 \text{ cm}^2$

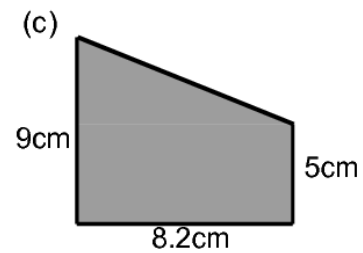
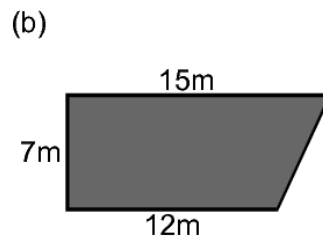
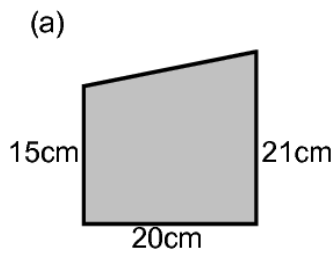
3) $A = \frac{1}{2}(6.2)(5)$
 $A = \frac{1}{2}(31.0)$
 $A = 15.5 \text{ cm}^2$

6) $A = \frac{1}{2}(4)(8.06)$
 $A = \frac{1}{2}(32.24)$
 $A = 16.12 \text{ cm}^2$

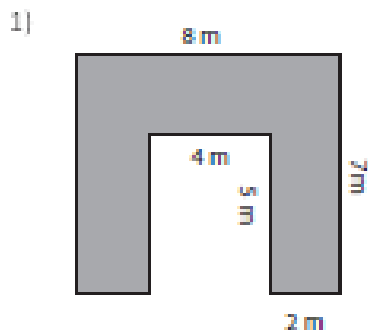
PROBLEM #3 PRACTICE: FINDING AREA AND PERIMETER OF COMPOSITE FIGURES

Online Help: [Sample Problems with Rectangles and Triangles](#), [Sample Problem Using Pythagorean Theorem](#)

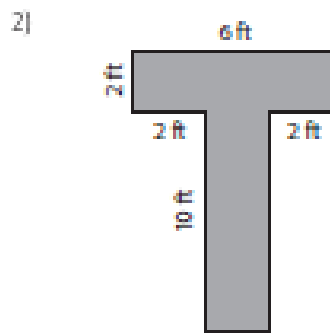
Find the area and perimeter of these figures.



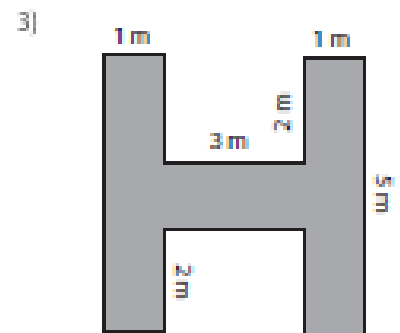
Find the area and perimeter of each shape.



Area: _____
Perimeter: _____



Area: _____
Perimeter: _____



Area: _____
Perimeter: _____

ANSWER KEY

- a) Area = $(15)(20) + \frac{1}{2}(20)(21-15) = 300 + 60 = 360 \text{ cm}^2$
Missing side = $20^2 + 6^2 = \sqrt{436} = 20.88 \text{ cm}$
Perimeter = $15 + 20 + 21 + 20.88 = 76.88 \text{ cm}$
- b) Area = $(15)(7) + \frac{1}{2}(7)(15-12) = 105 + 10.5 = 115.5 \text{ m}^2$
Missing side = $7^2 + 3^2 = \sqrt{58} = 7.62 \text{ m}$
Perimeter = $15 + 7 + 12 + 7.62 = 41.62 \text{ m}$
- c) Area = $(5)(8.2) + \frac{1}{2}(8.2)(9-5) = 41 + 16.4 = 57.4 \text{ cm}^2$
Missing side = $8.2^2 + 4^2 = \sqrt{83.24} = 9.12 \text{ cm}$
Perimeter = $9 + 8.2 + 5 + 9.12 = 31.32 \text{ cm}$
- 1) Area = $(2)(8) + (5)(2) + (5)(2) = 16 + 10 + 10 = 36 \text{ m}^2$
Perimeter = $8 + 7 + 2 + 5 + 4 + 5 + 2 + 7 = 40 \text{ m}$
- 2) Area = $(2)(6) + (10)(2) = 12 + 20 = 32 \text{ ft}^2$
Perimeter = $6 + 2 + 2 + 10 + 2 + 10 + 2 + 2 = 36 \text{ ft}$
- 3) Area = $(1)(5) + (3)(1) + (1)(5) = 13 \text{ m}^2$
Perimeter = $1 + 5 + 1 + 2 + 3 + 2 + 1 + 5 + 1 + 2 + 3 + 2 = 28 \text{ m}$

PROBLEM #4 PRACTICE: SIMPLIFYING ALGEBRAIC EXPRESSIONS

Online Help: [Box Method](#), [FOIL Method](#), [FOIL Song](#)

1) $(y + 5)(y - 8)$

2) $(c - 2)(3c + 6)$

3) $(9s - 8)(s + 5)$

4) $(9d + 3)(5d - 8)$

5) $(r + 2)(r + 9)$

6) $(n + 6)(3n + 7)$

7) $(2k + 6)(k + 7)$

8) $(4g + 7)(2g + 5)$

9) $(x + 4)(x - 8)$

10) $(s + 9)(3s + 6)$

ANSWER KEY

1) $y^2 - 3y - 40$

2) $3c^2 - 12$

3) $9s^2 + 37s - 40$

4) $45d^2 - 57d - 24$

5) $r^2 + 11r + 18$

6) $3n^2 + 25n + 42$

7) $2k^2 + 20k + 42$

8) $8g^2 + 34g + 35$

9) $x^2 - 4x - 32$

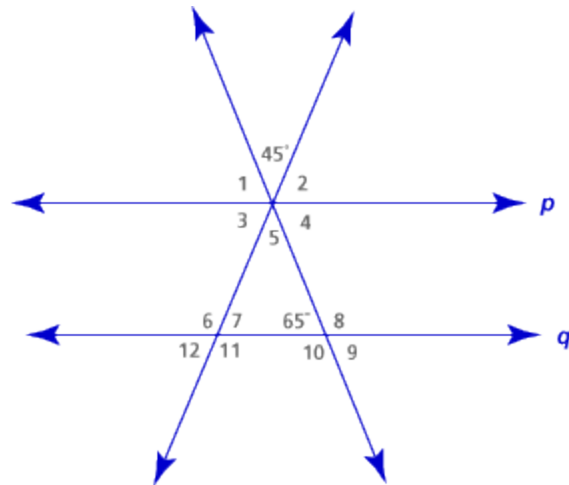
10) $3s^2 + 33s + 54$

PROBLEMS #5 AND #6 PRACTICE: ANGLE RELATIONSHIPS

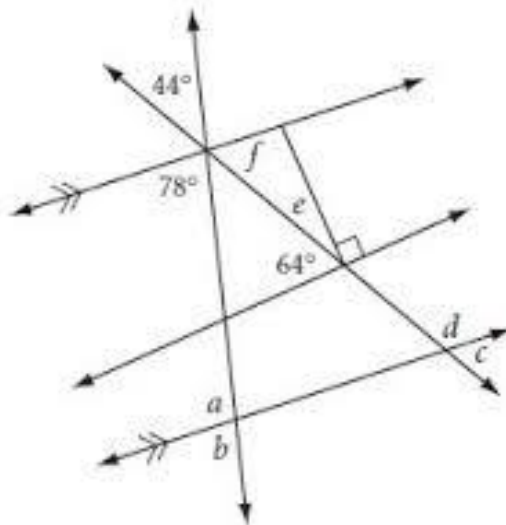
Online Help: [Problem #5 - Description of Angle Relationships](#), [Problem #6 - Sample Problem](#)

Find the measure of all labeled angles.

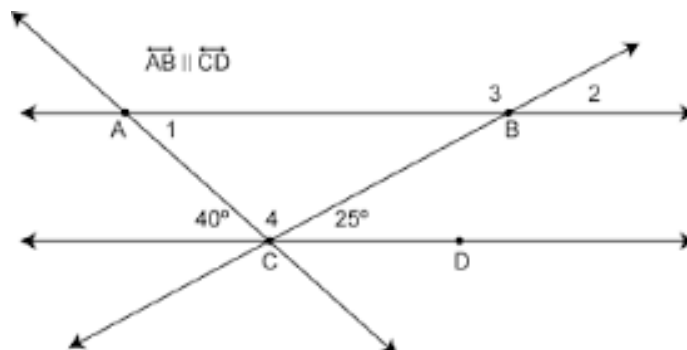
1.



2.



3.



ANSWER KEY

1) $m\angle 1 = 65^\circ$ $m\angle 5 = 45^\circ$ $m\angle 9 = 65^\circ$
 $m\angle 2 = 70^\circ$ $m\angle 6 = 110^\circ$ $m\angle 10 = 115^\circ$
 $m\angle 3 = 70^\circ$ $m\angle 7 = 70^\circ$ $m\angle 11 = 110^\circ$
 $m\angle 4 = 65^\circ$ $m\angle 8 = 115^\circ$ $m\angle 12 = 70^\circ$

2) $m\angle a = 102^\circ$ $m\angle e = 26^\circ$
 $m\angle b = 78^\circ$ $m\angle f = 58^\circ$
 $m\angle c = 58^\circ$
 $m\angle d = 122^\circ$

3) $m\angle 1 = 40^\circ$
 $m\angle 2 = 25^\circ$
 $m\angle 3 = 155^\circ$
 $m\angle 4 = 115^\circ$

PROBLEM #7 PRACTICE: FINDING ANGLES USING ALGEBRA

Online Help: [Sample Problem Using Corresponding Angles](#), [Sample Problem Using Straight Angles](#)

Instructions: For each exercise, write the type of angle relation shown; find x then find the measure of the angle in **bold**.

1)

2)

3)

4)

5)

6)

7)

8)

9)

10)

11)

12)

13)

14)

15)

ANSWER KEY

<p>1) Corresponding Angles $6x+13 = 7x+5$ $x = 8$</p> <p>$7(8) + 5 = 61^\circ$</p>	<p>2) Alternate Interior Angles $7 + 18x + 19x = 180^\circ$ $37x = 173$ $x = 4.68$</p> <p>$7 + 18(4.68) = 91.24^\circ$</p>	<p>3) Same Side Interior Angles $x+90+x+110 = 180^\circ$ $2x = -20$ $x = -10$</p> <p>$-10+110 = 100^\circ$</p>	<p>4) Corresponding Angles $23x+3 = 22x+7$ $x = 4$</p> <p>$23(4) + 3 = 95^\circ$</p>
<p>5) Vertical Angles $6x+16 = 8x-2$ $18 = 2x$ $x = 9$</p> <p>$6(9) + 16 = 70^\circ$</p>	<p>6) Vertical Angles $6x = 5x+10$ $x = 10$</p> <p>$6(10) = 60^\circ$</p>	<p>7) Same Side Interior Angles $x+43+x+143 = 180^\circ$ $2x = -6$ $x = -3$</p> <p>$-3 + 143 = 140^\circ$</p>	<p>8) Straight Angles $x+103+83+x = 180^\circ$ $2x = -6$ $x = -3$</p> <p>$-3 + 103 = 100^\circ$</p>
<p>9) Alternate Interior Angles $11x+5+13x-5 = 180^\circ$ $24x = 180$ $x = 7.5$</p> <p>$11(7.5)+5 = 87.5^\circ$</p>	<p>10) Vertical Angles $13x+6 = 14x-2$ $x = 8$</p> <p>$14(8)-2 = 110^\circ$</p>	<p>11) Alternate Exterior Angles $9x+5 = 10x -5$ $x = 10$</p> <p>$10(10)-5 = 95^\circ$</p>	<p>12) Same Side Interior Angles $8x+10+10x-10 = 180^\circ$ $18x = 180$ $x = 10$</p> <p>$8(10) + 10 = 90^\circ$</p>
<p>13) Straight Angles $2x-6+7x+23 = 180^\circ$ $9x = 163$ $x = 18.11$</p> <p>$7(18.11)+23 = 149.78^\circ$</p>	<p>14) Straight Angles $-x+78+4x-18 = 180^\circ$ $3x = 120$ $x = 40$</p> <p>$4(40)-18 = 142^\circ$</p>	<p>15) Straight Angles $4x-3+5x+118 = 180^\circ$ $9x = 65$ $x = 7.22$</p> <p>$4(7.22) - 3 = 25.89^\circ$</p>	

PROBLEM #8 PRACTICE: GRAPHING LINES AND FINDING PERPENDICULAR SLOPES

Online Help: [How to Graph a Line When Given an Equation](#), [How to Graph a Line When Given a Slope and a Point](#), [How to Find Perpendicular Slopes](#), [How to Write an Equation for a Line When Given a Graph](#), [Sample Problem](#)

1. Write the equation of a line that is perpendicular to $y = -5x + 2$ that passes through the point $(10, 6)$.
2. Write the equation of a line that is perpendicular to $y = \frac{1}{2}x - 6$ that passes through the point $(6, 4)$.
3. Write the equation of a line that is perpendicular to $y = -\frac{1}{8}x + 2$ that passes through the point $(-4, 2)$.

ANSWER KEY

1. Write the equation of a line that is perpendicular to $y = -5x + 2$ that passes through the point (10,6).

Step 1) Find the opposite reciprocal of the slope.

Slope = -5 or -5/1 so the opposite reciprocal is 1/5

Step 2) Plug the new slope and the x and y given in the question into the point slope formula.

$$Y = mx + b$$

$$6 = (1/5)(10) + b$$

Step 3) Solve for b.

$$6 = 2 + b$$

$$4 = b$$

Step 4) Substitute new slope and b into slope intercept equation.

$$Y = (1/5)x + 4$$

2. Write the equation of a line that is perpendicular to $y = (1/2)x - 6$ that passes through the point (6,4).

Step 1) Find the opposite reciprocal of the slope.

Slope = (1/2) so the opposite reciprocal is -2

Step 2) Plug the new slope and the x and y given in the question into the point slope formula.

$$Y = mx + b$$

$$4 = (-2)(6) + b$$

Step 3) Solve for b.

$$4 = -12 + b$$

$$16 = b$$

Step 4) Substitute new slope and b into slope intercept equation.

$$Y = -2x + 16$$

3. Write the equation of a line that is perpendicular to $y = (-1/8)x + 2$ that passes through the point (-4,2).

Step 1) Find the opposite reciprocal of the slope.

Slope = (-1/8) so the opposite reciprocal is (1/8) or 8

Step 2) Plug the new slope and the x and y given in the question into the point slope formula.

$$Y = mx + b$$

$$2 = (8)(-4) + b$$

Step 3) Solve for b.

$$2 = -32 + b$$

$$34 = b$$

Step 4) Substitute new slope and b into slope intercept equation.

$$Y = 8x + 34$$

PROBLEM #9 PRACTICE: TRIANGLE INEQUALITY THEOREM

Online Help: [Explanation of Triangle Inequality Theorem](#), [Sample Problems](#)

State if each set of three numbers can be the lengths of the sides of a triangle.

- 1) 7, 10, 8
- 2) 7, 12, 24
- 3) 10, 7, 21
- 4) 3, 5, 9
- 5) 3, 12, 14
- 6) 8, 3, 9
- 7) 9, 13, 15
- 8) 10, 4, 11
- 9) 13, 5, 9
- 10) 12, 7, 20

Given are the lengths of two sides of a triangle. Find the range of lengths for the third side.

- 11) 4, 7
- 12) 3, 9
- 13) 11, 4
- 14) 6, 4
- 15) 6, 9
- 16) 3, 6

ANSWER KEY

1) Yes

2) No

3) No

4) No

5) Yes

6) Yes

7) Yes

8) Yes

9) Yes

10) No

11) $3 < x < 11$

12) $6 < x < 12$

13) $7 < x < 15$

14) $2 < x < 10$

15) $3 < x < 15$

16) $3 < x < 9$